
Clinimetric analysis of recently applied quantitative tools in evaluation of vitiligo treatment

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Introduction: In the field of Medicine, effective health measuring instruments are essential for both clinical practice and researching. The term 'Clinimetrics' refers to the science of development and evaluation of clinical assessment tools. Concerning -vitiligo, no curative therapy has been uniquely reported for this common, socially stigmatizing skin disorder. Furthermore, there is absolutely no uniformity in the evaluative approaches implicated in researches dealing with suppressing the pigment losing process in vitiligo patients. As reported by many authors, digital image analysis techniques are the best way to judge repigmentation capacity. Others see that simple techniques such as the point counting technique are more practical than computer-based methodologies. In addition, quantitative maneuvers are generally more accurate and reliable than simple visual observation of patients across treatment courses. In fact, we are in a tangible need for standardizing a quantitative assessment tool to precisely-capture sequential trends occurring within treated vitiligo lesions.**Objective:** The aim of this study was to find out the most ideal technique for quantitative assessment of therapeutic results in vitiligo patients via clinimetric analysis of handy measuring tools currently available for that -purpose.**Materials and Methods:** We outlined 2 main parameters targeted in follow up sessions of vitiligo patients who are on therapy: 1) changes in the affected surface area; and 2) changes in its color. For the surface area measurement, a sample of 100 vitiligo areas from nineteen volunteers were measured separately using 3 techniques: simple visual observation (SVO) using digital images of the lesions, transparency-based point counting technique (PCT), and digital image analysis for surface area measurement (DIASA). For color changes, another sample of 20 areas was selected from ten volunteers and imaged at 2 consecutive occasions (before and after treatment) to be subjected to color measurement with the aid of digital image analysis (DIACM) using $L^*a^*b^*$ color coordinates. Measurements were executed by 2 independent observers (a dermatologist and a computer expert). The obtained measurements were subjected to statistical analysis involving tests for non-parametric data to assess accuracy, sensitivity and reliability of each technique.**Results:** Regarding the 3 surface area measuring techniques, the results showed that they are all accurate, sensitive, and reliable measuring tools. Verifying the accuracy by assessing the encountered bias with each technique, revealed that the 'best accuracy' was gained by DIASA, followed by

PCT. Inversely, the highest bias occurred with SVO. The same grading of the 3 techniques was true regarding both intra- and inter-observer reliability (with DIASA being the most reliable, followed by PCT, and finally SVO). All of the 3 methods were capable of detecting that a change had occurred in a right way in all lesions, indicating 100% sensitivity. Concerning DIACM, it was revealed to be both accurate and reliable in getting a percentage representation of color improvement within the enrolled vitiligo lesions in response to the given therapies. Conclusion: DIA constitutes the best approach for quantitative assessment of treatment results in vitiligo patients. Our designated DIA technique was capable of assessing changes occurring in both SA and color of vitiligo lesions in response to therapy efficiently. Only for assessing SA of lesions, the PCT could be a sound alternate for DIA systems in absence of software facilities.